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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/670,903	09/25/2003	Ajit Yeshwant Sane	US 132670-1 60QZ	6040
36580	7590	05/17/2005	EXAMINER	
GE SPECIALITY MATER			GABOR, OTILIA	
ONE PLASTICS AVENUE			ART UNIT	
PITTSFIELD, MA 01201			PAPER NUMBER	
			2878	
DATE MAILED: 05/17/2005				

Please find below and/or attached an Office communication concerning this application or proceeding.

ER

Office Action Summary	Application No. 10/670,903	Applicant(s) SANE ET AL.	
	Examiner Otilia Gabor	Art Unit 2878	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 September 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 September 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>09/25/2003</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

1. Figures 1b-1c should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

2. The abstract of the disclosure is objected to because it contains the language "The invention relates". Correction is required. See MPEP § 608.01(b).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Leist et al. (U. S. patent 6,624,423) and further in view of Honma et al. (U. S. Patent 5,693,581).

Regarding claims 1, 2, 10, 18 Leist discloses a detector for thermal neutron, a method of making a thermal neutron detector, and a method for measuring a thermal neutron emission from a neutron source, the detector comprising: at least a pBN layer having a thickness between 1-1000 microns between the opposed edge surfaces, at least one metalized contact on each of the opposed surfaces to detect the presence of neutrons striking one of the two opposed surfaces, wherein the pBN layer is doped with an elemental dopant of carbon or carbon and oxygen (see Fig.1a, Figs.2-4, Col.3, lines 40-Col.4, line 55). Leist discloses a method of forming a neutron detector to detect the presence of neutrons, the method comprising the steps of: forming at least a layer having a resistivity, a thickness between 1-1000 microns between the opposed edge surfaces, and containing pyrolytic boron nitride (pBN) containing boron-10 (^{10}B) isotope

and an elemental dopant from the group of carbon or carbon and oxygen, and forming electrical contacts on each of the opposite sides of the doped pBN layer (see Col.3, line 40-Col.4, line 46, Col..5, line 1-Col.6, line 23).

Regarding claims 1, 6, 10, 18, Leist discloses (in Col.4, lines 37-45) that in order to change the resistivity the pBN layer can be doped with carbon or carbon and oxygen, and the amount of doping in the pBN layer will determine the final resistivity. However, Leist fails to disclose that the doping is such that the resistivity is less than 10^{14} ohm-cm, and that the amount of doping in the pBN layer is less than about 3 wt%. Honma discloses a pyrolytic boron nitride (pBN) device and method of making the device where in order to reduce the resistivity to less than 10^{14} ohm-cm, the pBN layer is doped with carbon in the amount of less than about 3 wt% (see Col.3, lines 1-46, Col.4, lines 1-46). It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the doping ratio and doping method of Honma to dope the pBN layer of Leist, since as disclosed by Leist this is a preferred option to changing the resistivity, and because a reduced resistivity eliminates the problem of electrical charge and electrostatic field accumulation in the pBN layer.

Regarding claim 2 Leist discloses oxygen as the second dopant used together with carbon to dope the pBN layer.

Regarding claims 3, 13 Leist discloses that each of the opposite surfaces has a plurality of contacts where the contact are separated from each other by a distance of between 20 and 100 microns (see claim 2, 7 in Col.4, 5).

Regarding claim 4, Leist discloses that the thickness between the opposed edge surfaces is less than about 100 microns (see claim 3 in Col.4).

Regarding claim 5 Leist discloses that the contact is in the form of a metalized strip (see claim 5 in Col.4).

Regarding claims 7, 17, 19 Leist discloses that the pBN layer is produced by a vapor phase reaction process with a ¹⁰B-enriched boron halide feed for the pBN and the admitted prior art on page 2, line 23 discloses that conventionally the pBN comprises roughly about 10 atomic % boron-10 isotope. Since conventionally it comprises roughly 10 atomic % boron-isotope, having the pBN layer contain 12 atomic % boron-10 isotope would have been obvious to one having ordinary skill in the art, since the word "roughly" is meant to incorporate more than 10%, and since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art (*In re Aller*, 220 F.2d 454, 105 USPQ 233, 235 (CCPA 1955)).

Regarding claims 8, 9, 18, 20 Leist discloses a method of measuring thermal neutron emissions from a neutron source using the neutron detector as disclosed in the abovementioned paragraphs, whereby the detector is oriented to the source of neutrons for the neutrons to enter the detector and interact with the boron in the pBN layer for electrons to be released and conduct through the doped pBN layer (see Col.2, lines 51-55).

Regarding claims 11, 12, 14 Leist also discloses a method of forming the electrical contact, the method comprising the steps of: forming a photosensitive resist

layer on a surface of the pBN material, passing light through a mask onto the photosensitive resist layer with the mask having a desired pattern to create a cured image of the pattern on the photosensitive resist layer where the light gets through the mask, removing the cured resist from the resist layer to form channels in the resist material, applying an etchant in the channels to form a corresponding trenches in the pBN material below the channels, evaporating metal material over the resist material and over the trenches to form an array of metalized contact strips aligned parallel to each other (see Col.5, line 18-Col.6, line 8, Fig.2).

Regarding claims 15, 16 Leist discloses that the electrical contacts are formed by ion implantation in which a dopant, such as carbon, is implanted in the surface of the pBN material forming the metal contact strips having a controlled resistivity at the implanted surface of the pBN (see claims 9, 10 in Col.6).

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: Doty (6,727,504) – boron nitride solid state neutron detector.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Otilia Gabor whose telephone number is 571-272-2435. The examiner can normally be reached on Monday, Thursday-Friday between 9am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Porta can be reached on 571-272-2444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Otilia Gabor
Primary Examiner
Art Unit 2878

A handwritten signature in cursive script, appearing to read 'Otilia Gabor', is positioned below the printed name and title.